"Magnetic resonance of trapped ions by spin-dependent cyclotron acceleration", Bull. Magn. Reson. 14, 220-223 (1992). Another technique for magnetic resonance force microscopy creates the AC force at the Larmor frequency by spin-locking the transverse magnetization in the presence of a ferromagnetic particle, which provides a static field gradient. Sidles, "Noninductive detection of single-proton magnetic-resonance", Appl. Phys. Lett. 58, 2854-2856 (1991). If either the sample or the ferromagnetic particle is bound to a cantilever with a mechanical resonance close to the Larmor frequency, its harmonic motion will be resonantly driven. Related magnetic resonance methods using time-dependent longitudinal magnetization have been demonstrated and show great promise for extending spin spectroscopies to micron scale and below. Sidles, "Magnetic-resonance force microscopy", Rev. Mod. Phys. 67, 249-265 (1995), Leskowitz et al., "Force-detected magnetic resonance without field gradients", Sol. St. Nucl. Magn. Reson. 11, 73-86 (1998) and "Force-detected magnetic resonance without field gradients", Bull. Am. Phys. Soc. 44, 543 (1999), and U.S. Patent No. 6,100,687 issued from U.S. Patent Application No. 08/872,528, "Force-Detected Magnetic Resonance Independent of Field Gradients" by Weitekamp et al. Single-spin designs have been

proposed based on audiofrequency nanoscale cantilevers with force sensitivity at a level of attonewton/$(Hz)^{1/2}$. --

Please replace the paragraph beginning at page 30, line 5 with the following rewritten paragraph:

-- An efficient strategy for obtaining and sorting out a large set of such distinct composite signals is based on the Hadamard matrices, a linearly independent set of matrices each element of which is zero (off) or one (on). The elements of these matrices are assigned in one-to-one correspondence with each oscillator. A set of measurements is made, with each oscillator turned on or off according to the corresponding element of a different Hadamard matrix. The Hadamard transform deconvolves from this signal the signal from each oscillator, with the assumption that it contributed identically in each measurement in which it was on. Thus this transformed data set is an image of the underlying surface, or more generally of the environment of the oscillators, with each oscillator contributing a pixel.--

Please replace the paragraph beginning at page 30, line 19 with the following rewritten paragraph:

-- The states indicated as on and off might differ only in the distance between the probe and the sample, controlled, for example, by piezoelectric or thermal expansion of the probe dimension perpendicular to the surface. Note that this same strategy could be used in cases where the detection did not involve an optically driven mechanical oscillator, but some other means of spectroscopy relying on near field enhancement. Both apertureless near-field scanning optical microscopy and surface-enhanced Raman spectroscopy are examples where the signal is light scattered by the surface species of interest enhanced by the presence of a nanoscale tip. Hadamard transform versions of these methods would be advantageous in extending them to linear or planar arrays of probes, thereby increasing sensitivity and throughput, while retaining spatial resolution.--

a3

In the claims:

Please cancel claims 5, 27, 30 and 31.

Please amend claims 1, 4, 6-8, 10, 12-13, 17-20, 23, 28, 32, 34, 37-39, 43 and 50 as follows:

a4

-- 1. A system, comprising:

a probe module, having a probe responsive to a probe excitation field at a probe polarization frequency to produce a